

What is claimed is:

1. An ion pump comprising:
a combined housing and cathode structure, formed of a cathode material, and forming a vacuum tight seal and having a vessel connected to said housing;
an anode, formed within said housing; and
a magnet, surrounding at least a portion of said housing,
and
a connection for a voltage source of a type that allows pumping.
2. A pump as in claim 1, wherein said housing and cathode structure is formed of titanium.
3. A pump as in claim 1, wherein said magnet is formed in a substantially C shape.
4. A pump as in claim 3, wherein said magnet is formed of one of hiperco-50 magnetic material.
5. A pump as in claim 1, wherein said housing and cathode structure includes a plurality of substantially extending posts, which extend towards said anode.

6. A pump as in claim 1, wherein said anode is formed of a plurality of cylindrical elements, having openings therein.

7. A pump as in claim 6, wherein said housing and cathode structure includes a plurality of extending posts, which extended in a similar direction to an axis of said cylindrical elements.

8. A pump as in claim 7, wherein said posts extend into said opening in each of said plurality of cylindrical elements.

9. A pump as in claim 1, further comprising a voltage source, which applies a voltage potential between said anode and said housing.

10. An ion pump, comprising:
a vacuum tight housing formed of titanium, defining a chamber therein;
an anode, formed within the chamber, and having an electrical connection which extends to an outside of the chamber, said anode formed of at least one cylinder extending along a specified direction;

said housing having an inner surface with at least first and second extending posts of titanium, which extend into an

inside of said at least one cylinder; and

a magnet, surrounding at least a portion of said housing and forming a magnetic field within said housing.

11. An ion pump as in claim 10, wherein said magnetic field extends along a direction that is coaxial with said axis of said anode.

12. An ion pump as in claim 10, further comprising a GCMS a system receiving its vacuum from said ion pump.

13. An ion pump as in claim 10, wherein said magnet is formed of a high energy product value magnet.

14. A method, comprising:
forming an ion pump using a vacuum housing which acts as the cathode of said ion pump.

15. A method as in claim 14, further comprising using a plurality of anodes within said vacuum housing along with said cathode.

16. A method as in claim 15, further comprising providing a magnetic field in said vacuum housing.

17. A method as in claim 16, further comprising applying a potential difference between said vacuum housing and said anodes to cause ion pumping.

18. A method as in claim 17, wherein said anodes are substantially cylindrical, and further comprising a post surface on an inside surface of said vacuum housing which extends into an inside of said anode.

19. An ion pump, comprising:
a vacuum tight a housing formed of titanium, defining a chamber therein, and defining a plurality of posts each extending in a specified axial direction;
a plurality of anodes formed of the conductive material, each of said plurality of anodes being hollow and having axes which expand in said axial direction, and each of said plurality of anodes formed such that at least one of said plurality of posts extends into an inside portion of the hollow anode; and
a vacuum tight connector, enabling application of low voltage between said anodes and said housing, to cause ion pumping therebetween.

20. An ion pump as in claim 19, further comprising a magnet, surrounding at least a portion of said housing.